Customer No.: 31561
Application No.: 10/065,874
Docket No.: 9788-US-PA

REMARKS

I. Present Status of the Application

The Office Action rejected the following claims under 35 U.S.C. § 103(a) as being unpatentable: Claims 1-3, 5, 8-14, 16, 19 and 20 over the applicant's admitted prior art ("AAPA") in view of Kanaya et al. (US 6,025, 217) and Havemann et al. (US 5,747,880); claims 4 and 15 over AAPA in view of Kanaya et al. and Havemann et al., as applied to claims 1 and 10, and further in view of Haven et al. (US 6,380,670); claims 6, 7, 17 and 18 over AAPA in view of Kanaya et al. and Havemann et al., as applied to claims 1 and 10, and further in view of Campion et al. (US 6,201,917 B1); claims 1-3, 5, 8-14, 16, 19 and 20 over AAPA in view of Kanaya et al. and Numata (US 5,519,250); and claims 6, 7, 17 and 18 over AAPA in view of Kanaya et al. and Numata, as applied to claims 1 and 10, and further in view of Campion et al.

Upon entry of the amendments in this response, claims 1, 7, 10 and 18 are amended, claims 6 and 17 are canceled, and claims 21 and 22 are newly added. Claims 1-5, 7-16, and 18-22 are now pending in the present application, with claims 1 and 10 being independent claims. Claims 1 and 10 have been amended by incorporating limitations in cited in the original claims 6 and 17, respectively. Claims 21 and 22 have been added according to the disclosure in specification, paragraph [0025]. Accordingly, Applicant believes that the foregoing amendments do not introduce new matter. Thus, reconsideration of those claims is respectfully requested.

II. Response to Rejections

A. Claims 1-3, 5, 8-14, 16, 19 and 20 over AAPA in view of Kanaya et al. and Havemann et al.

The Office Action, at pages 2-3, rejected claims 1-3, 5, 8-14, 16, 19 and 20 under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of Kanaya et al. and Havemann et al. The Examiner states that AAPA does not teach to form a porous material layer, that Kanaya et al. teach an insulating layer but are silent to using a porous material as the insulating layer, and that Havemann et al. teach porous silicon oxide has a lower thermal conductivity than solid silicon oxide. Examiner further asserts that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use porous silicon oxide as an insulating layer on top of the stress buffer layer, which reads on claim 10, and to use the insulating layer as the stress buffer layer, which reads on claim 1. Applicant respectively traverses the rejections as applied to the amended claims for at least the reasons set forth below.

To establish prima facie obviousness of a claimed invention, all the claim limitation must be taught or suggested by the prior art. M.P.E.P. § 2143.

The independent claim 1, as amended, recites as follows:

1. A method for fabricating a polysilicon layer, comprising:

providing a substrate;

forming a barrier layer on the substrate;

forming a porous material layer on the barrier layer, wherein the porous material layer comprises an alloy of silicon oxide and aluminum oxide, and the barrier layer and the porous material layer form a buffer layer;

forming an amorphous silicon layer on the porous material layer; and

performing a laser annealing process to form a polysilicon layer.

(Emphasis added). The independent claim 10 recites that, in addition to the elements recited in claim 1, the method comprising a step of forming a stress buffer layer on the barrier layer. Apparently, either claim 1 or claim 10 has a limitation that "the porous material layer comprises an alloy of silicon oxide and aluminum oxide."

As stated by the Examiner, AAPA does not teach to form a porous material layer, Kanaya et al., though teaching an insulating layer, are silent to using a porous material as the insulating layer. Regarding the third reference, even though teaching that porous silicon oxide has a lower thermal conductivity than solid silicon oxide (column 2, lines 51-61), Havemana et al. do not teach or suggest that the porous material layer comprises "an alloy of silicon oxide and aluminum oxide," as recited in both claims 1 and 10 of the present invention.

Thus, the cited prior art references, as considered as a whole, fail to suggest or motivate to use an alloy of silicon oxide and aluminum oxide in the porous material layer as in the claimed invention. Consequently, the independent claims 1 and 10, or the claims 2, 3 5, 8, 9, 11-14, 16, 19 and 20 dependent thereupon, are not rendered obvious over the cited prior art references.

Accordingly, for at least the foregoing reasons, Applicant respectfully submits that the grounds of rejection have been addressed and the rejection has been overcome. Reconsideration and withdrawal of the rejection are respectfully requested.

B. Claims 4 and 15 over AAPA in view of Kanaya et al., Havemann et al., and Haven et al.

The Office Action, at pages 3-4, rejected claims 4 and 15 under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of Kanaya et al. and Havemann et al., as applied to claims 1 and 10, and further in view of Haven et al. Applicant respectively traverses the rejections as applied to the amended claims.

As discussed in the foregoing subsection II.B, the independent claims 1 and 10, as amended, are not rendered obvious over AAPA in view of Kanaya et al. and Havemann et al. Here, Haven et al., even though teaching that porous silicon oxide may be deposited by e-bean evaporation (column 13, lines 23-26 and 42-46), do not teach or suggest that the porous material layer comprises "an alloy of silicon oxide and aluminum oxide," as recited in both claims 1 and 10, and inherited by the dependent claims 4 and 15 at issue.

Thus, the cited prior art references, as considered as a whole, fail to suggest or motivate to use an alloy of silicon oxide and aluminum oxide in the porous material layer as in the claimed invention.

Accordingly, for at least the foregoing reasons, Applicant respectfully submits that the grounds of rejection have been addressed and the rejection has been overcome. Reconsideration and withdrawal of the rejection are respectfully requested.

C. Claims 6, 7, 17 and 18 over AAPA in view of Kanaya et al., Havemann et al. and Campion et al.

The Office Action, at pages 4-5, rejected claims 6, 7, 17 and 18 under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of Kanaya et al. and Havemann et al., as applied to claims 1 and 10, and further in view of Campion et al. Applicant respectively traverses the rejections as applied to the amended claims 1, 7, 10 and 18.

As discussed in the foregoing subsection II.B, the independent claims 1 and 10, as amended, are not rendered obvious over AAPA in view of Kanaya et al. and Havemann et al. Here, Even though Campion teaches that "a peripheral zone made of silica doped with alumina" (abstract; column 8, column 8, lines 5-20), Campion's silica is solid silica rather than porous silica. Thus, if there were suggestion or motivation, one of ordinary skill in the art at the time the invention was made would only dope the solid silica (but not porous silica) with alumina; the resulting combination, if made, is still different from that of the invention, as recited in claims 1 and 10 (or the original claims 6 and 17) and inherited by the dependent claims 7 and 18.

Thus, the cited prior art references, as considered as a whole, fail to suggest or motivate to use an alloy of silicon oxide and aluminum oxide in the porous material layer as in the claimed invention. Consequently, claims 6, 7, 17 and 18 are not rendered obvious over the cited prior art references.

Accordingly, for at least the foregoing reasons, Applicant respectfully submits that the grounds of rejection have been addressed and the rejection has been overcome. Reconsideration and withdrawal of the rejection are respectfully requested.

D. Claims 1-3, 5, 8-14, 16, 19 and 20 over AAPA in view of Kanaya et al. and Numata

The Office Action, at pages 5-6, rejected claims 1-3, 5, 8-14, 16, 19 and 20 under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of Kanaya et al. and Numata. The Examiner states that Numata teaches that silica aerogel, a sol-gel derived silicon oxide, is very porous and has negligible thermal conductivity, and that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use porous silica aerogel to combine with the teachings of AAPA and Kanaya et al., achieving the results of the claimed invention. Applicant respectively traverses the rejections as applied to the amended claims for at least the reasons set forth below.

Similar to Havemana et al. as mentioned in the foregoing subsection II.A, even though teaching that porous silica aerogel has negligible thermal conductivity (column 8, lines 26-29), Numata does not teach or suggest that the porous material layer comprises "an alloy of silicon oxide and aluminum oxide," as recited in both claims 1 and 10 of the present invention.

Thus, the cited prior art references, as considered as a whole, fail to suggest or motivate to use an alloy of silicon oxide and aluminum oxide in the porous material layer as in the claimed

invention. Consequently, the independent claims 1 and 10, or the claims 2, 3 5, 8, 9, 11-14, 16, 19 and 20 dependent thereupon, are not rendered obvious over the cited prior art references.

Accordingly, for at least the foregoing reasons, Applicant respectfully submits that the grounds of rejection have been addressed and the rejection has been overcome. Reconsideration and withdrawal of the rejection are respectfully requested.

E. Claims 6, 7, 17 and 18 over AAPA in view of Kanaya et al., Numata and Campion et al.

The Office Action, at page 6, rejected claims 6, 7, 17 and 18 under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of Kanaya et al. and Numata, as applied to claims 1 and 10, and further in view of Campion et al. Applicant respectively traverses the rejections as applied to the amended claims 1, 7, 10 and 18.

As discussed in the foregoing subsection II.D, the independent claims 1 and 10, as amended, are not rendered obvious over AAPA in view of Kanaya et al. and Numata. Here, Even though Campion teaches that "a peripheral zone made of silica doped with alumina" (abstract; column 8, column 8, lines 5-20), Campion's silica is solid silica rather than porous silica. Thus, if there were suggestion or motivation, one of ordinary skill in the art at the time the invention was made would only dope the solid silica (but not porous silica) with alumina; the

resulting combination, if made, is still different from that of the invention, as recited in claims 1 and 10 (or the original claims 6 and 17) and inherited by the dependent claims 7 and 18.

Thus, the cited prior art references, as considered as a whole, fail to suggest or motivate to use an alloy of silicon oxide and aluminum oxide in the porous material layer as in the claimed invention. Consequently, claims 6, 7, 17 and 18 are not rendered obvious over the cited prior art references.

Accordingly, for at least the foregoing reasons, Applicant respectfully submits that the grounds of rejection have been addressed and the rejection has been overcome. Reconsideration and withdrawal of the rejection are respectfully requested.

III. New Claims

Claims 21 and 22 have been newly added to further define the scope of the invention, the support thereof can be found in, for example, specification, paragraph [0025]. The above new claims are submitted to be patentable over the prior art of record for at least that they are dependent on claims 1 and 10, respectively, which are allowable over the prior art of record as discussed in the foregoing section.

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CONCLUSION

For at least the foregoing reasons, it is believed that the pending claims 1-5, 7-16, and 18-22 are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,

Date : Dec. 12, 2003

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